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ABSTRACT

This study's investigator concludes that expenditures for elementary and secondary education in California must rise by 59 percent by the end of the decade to maintain the present level of per student spending and to meet forecasted educational improvement needs. Revenue funding and demographic projections presented indicate inadequate revenues for improvements. Key factors discussed and presented in tables are population, student enrollments, personal income, and inflation. The report evaluates all governmental revenue sources, noting that real revenues per student have increased only 12.7 percent during the last decade and that the purchasing power of K-12 revenues has declined. State revenues supply a majority of K-12 dollars, but revenues derived from personal income have dropped 29.1 percent, reflecting a national trend. Public school enrollments are projected to grow yearly through 1990. The report argues that this larger student population will require a significant increase in number of teachers to maintain the national average pupil-teacher ratio of 17.1 to 1. Alternative funding scenarios are considered and rejected as unlikely. The conclusion is that a demand for educational improvements in the form of real tax revenues per capita will not occur, nor will competing revenue demands from other state programs diminish. (CJH)

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Jack W. Osman

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March 1985
(Revised November 1985)

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EXECUTIVE SUMMARY

Expenditures for elementary and secondary education in California must rise by about 59 percent between 1983-84 and the end of the decade just to maintain the status quo in terms of real per student spending. This would amount to a K-12 budget in 1989-90 of $21.9 billion.

Yet, kindergarten-through-twelth-grade revenues are projected to grow by only 50 percent (under one scenario) or by about 72 percent (under another). In other words, unless the revenue structure is significantly altered, projected school revenues through 1990 will be inadequate to maintain the same level of spending per student or will increase at a pace only slightly faster than that needed to stay even. Still, in the latter case, few improvements could be funded. Efforts to increase teacher salaries in real terms, to reduce class size, or to provide for substantially higher resources per student cannot reach fruition if these estimates of school revenue growth are accurate.

Population, student enrollments, personal income, and inflation are key factors influencing the availability of future school revenues. A combination of extrapolative and econometric techniques are used in this report to derive projections for these variables. Recent trends are informative also.

During the last 10 years, real revenues per student have increased a total of only 12.7 percent. However, in half of those years the purchasing power of K-12 revenues per student actually declined.

California's elementary and secondary school dollars are now derived overwhelmingly from state revenues (78.3 percent in 1982-83). The growth of state revenues in California, however, has not kept pace with the growth in state personal income. This has been true not only for education but also for state and local revenues in general. As a percent of California personal income, state and local revenues have dropped from 15.8 percent in 1978 to 11.2 percent in 1982, a 29.1 percent drop in four years. In part, this relects the effects of Proposition 13; it is also part of a national trend, though considerably more pronounced in California.

California's total population is expected to grow by 4.2 million persons during the 1980s, though this growth will not be uniform across age groups.

Public school enrollments declined during the early 1980s. But after 1984, enrollments (and ADA consequently) are projected to grow each year through 1990. Enrollments in

1990 are expected to be about 565,000 students or 13.9 percent above the 1984 level, a total student population of 4.6 million.

This increased student population will require a significant increase in the number of public school teachers. California will need approximately 23,400 additional teachers by 1990 in order to maintain the 1983-84 California student-teacher ratio of 23.9 to 1. To move by decade's end to the national average of 17.1 to 1, California would need another 99,500 teachers.

These data are used in developing projections of school revenue growth. The methodology is to estimate the responsiveness of K-12 revenues to growth in personal income (elasticities) during the post-Proposition 13 era. The elasticities are combined with income projections to forecast school revenues. Since the responsiveness of revenues to income varies with the period examined, several alternatives are provided.

In the two most likely scenarios, the ratio of K-12 revenues to state personal income falls over time.

If no major changes are instituted in the revenue structure for K-12 education, then school revenues are expected to reach between $20.6 billion and $23.6 billion by 1989-90.

Current K-12 revenues per ADA are expected to reach between $4,232 and $4,847 by the end of the decade. Yet, in constant dollar terms, $4,232, the figure derived from the the first and more conservative of two scenarios, translates into a drop in funding per ADA of $167. On the other hand, $4,847, a figure derived from a second and more positive scenario, equals a modest increase in funding per ADA of $79.

If K-12 revenues were to grow as rapidly as state personal income, then real spending per student would increase by $130 or 8.7 percent over the next five years. But this is not expected.

Finally, real tax revenues per capita will not increase substantially through the end of the decade over levels expected for the next year, and may even decline. Nor will the competing revenue demands from other state programs diminish. The overall conclusion is that a demand for increased expenditures to improve K-12 education will not likely be aided by increases in state revenue growth or a reduction in the expenditure demands from competing state programs.

ACKNOWLEDGEMENTS

I wish to acknowledge the aid and encouragement provided by James Guthrie, and the thoughtful comments and suggestions by Charles Benson, Walter Garms, and David Stern. Eric Hartwig did yeoman service in the development of the alternative measure of educational revenues appearing in the Addendum. All have improved this paper. Any remaining errors and shortcomings are mine.

POLICY ANALYSIS FOR CALIFORNIA EDUCATION

Policy Analysis for California Education, PACE, is a university-based research center focusing on issues of state education policy and practice. PACE is located in the Schools of Education at the University of California, Berkeley and Stanford University. It is funded by the William and Flora Hewlett Foundation and directed jointly by James W. Guthrie and Michael W. Kirst.

PACE efforts center on four tasks: (1) collecting and distributing objective information about the conditions of education in California, (2) analyzing state education policy issues and the policy environment, (3) evaluating school reform implementation efforts and state education practices, and (4) facilitating communication among policymakers, researchers, and others.

The PACE research agenda is developed in consultation with public officials and staff. In this way, PACE endeavors to address policy issues of immediate concern and to fill the short-term needs of decisionmakers for information and analysis.

PACE publications include Policy Papers, which report research findings; the Policy Forum, which presents the views of notable individuals; and Update, a quarterly annotated list of all PACE papers completed and in the works.

PACE is located at 3659 Tolman Hall, School of Education, University of California, Berkeley, California 94720. Additional copies of this paper may be obtained by writing PACE at this address. Send $3.00 per copy, checks payable to Regents of UC.

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INTRODUCTION

Forecasting revenues is an integral part of the public planning and budgetary process. The availability of revenues sets a limit on the resources which may be commanded for accomplishing specific government objectives. On the other hand, projecting the levels of "necessary" expenditures can be equally important for program planning and the budgetary process.[1]

Revenue forecasting seeks to identify those factors impacting on revenues and to estimate their effect in order to project the availability of future revenues. Expenditure forecasting, on the other hand, is aimed at estimating the future levels of spending that would be required to meet particular objectives. Since expenditures must be met by equal revenues, the actual levels of spending obtained are determined by the revenue constraint. Thus, an important function of revenue and expenditure projections is to see whether existing revenue structures will provide adequate revenues to meet the "necessary" level of expenditure. Where it is clear that such is not the case, the critical policy options involve planning for change in the revenue structure to provide added revenues, cutting back on expenditures by scaling back the objectives to be met, or by a combination of the two options.

Forecasting methods may be divided into two broad categories: qualitative and quantitative. The former relies on the judgments and experience of the decision makers while the latter uses historical data to uncover relationships which may then be used for making forecasts.[2] Quantitative methods range from simple extrapolations to Delphi methods to the use of econometric models with parameters estimated through regression methods. Combinations of these methods are possible as well.

Generally, the forecasts based on econometric models are more accurate than trend-line extrapolations, but are more time consuming and costly as well.[3] The tradeoffs between cost and accuracy have improved dramatically in the past decade with the major advances in computing which have dramatically lowered the cost of data manipulation, parameter estimation, and system solution. The revenue forecasts developed in this paper involve a combination of econometric and extrapolative methods.

THE CURRENT SETTING AND TRENDS

In order to make projections of future revenues and expenditures it is necessary to examine the current levels and recent changes. Further, in order to address the issue of adequacy it is useful to compare California's revenues and expenditures with those of the rest of the nation.

Table 1 displays recent trends in the total revenues generated for K-12 education in California, together with trends in the numbers of students in average daily attendance (ADA). While revenues are expected to be about twice as high this year, 1984-85, as in the 1975-76 school year, revenues per student are considerably more than twice as great due to the drop in ADA. However, this has been a period characterized by major inflation. When inflation is adjusted for, it is estimated that the real revenues per ADA (in constant 1972 dollars) have increased from 1975-76 to the present by only 12.7 percent (from $1,287 to $1,451). It should be noted that in half the years shown, the purchasing power of K-12 revenues per student declined.

Several caveats should be noted in passing. First, the data for 1983-84 and 1984-85 are subject to revision. The former are based on estimates, while the latter are based on the amounts contained in the current (1984-85) budget act as passed. Second, the deflator used by the Legislative Analyst is the U.S. Gross National Product implicit price deflator for state and local purchases of goods and services, and it is not specific to California. However, this index differs only slightly from the California Consumer Price Index (CPI), and any differences from the use of one series or the other would not materially change the conclusions reached from Table 1.

Sources of Revenues by Level of Government

Elementary and secondary school revenues are derived primarily from state sources. The shift in the past decade and a half may be seen from Table 2. In 1969-70, local government revenues dominated in California, the West, and the nation as a whole. While a bare majority of revenues nationally were derived from state sources in 1982-83, over three-fourths were generated by state sources in California and the West.

Table 3 displays the sources of K-12 revenues divided between federal on the one hand and state and local on the other, for the 1983-84 school year (estimated) and the current year (as enacted). In addition, estimated and projected California personal income for 1983-84 and 1984-85, respectively, are displayed. It is estimated that state and local revenues for K-12 education were 3.39 percent of personal income, while federal revenues were 0.27 percent of California personal income. It is projected that both federal, and state and local revenues will fall as a percent of California personal income so that total K-12 revenues will be about 3.40 percent of state personal income.

TABLE 1
TRENDS IN TOTAL REVENUES FOR K-12 EDUCATION
1975-76 THROUGH 1984-85

Year	Total Funding (Millions)	ADA	Total Funding Per ADA			
			Current Dollars		1972-73 Dollars	
			Amount	% Change	Amount	% Change
1975-76	$7,587.9	4,760,966	$1,650	7.8	$1,287	-0.2%
1976-77	8,654.7	4,718,800	1,834	11.2	1,342	4.3
1977-78	9,516.6	4,652,486	2,045	11.5	1,393	3.8
1978-79	9,425.6	4,271,181	2,207	7.9	1,388	-0.4
1979-80	10,981.6	4,206,150	2,611	18.3	1,497	7.9
1980-81	11,732.8	4,214,089	2,784	6.6	1,457	-2.7
1981-82	11,929.8	4,200,678	2,840	2.0	1,379	-5.4
1982-83	12,593.1	4,230,065	2,977	4.8	1,355	-1.7
1983-84*	13,732.1	4,280,719	3,208	7.8	1,378	1.7
1984-85**	15,603.8	4,346,948	3,590	11.9	1,451	5.3

* Estimated ** As Enacted

Sources: Legislative Analyst, Summary of Legislative Action on the Budget Bill: 1984-85 Fiscal Year , Table 7, p.16.
Legislative Analyst Budget Review, 1983-84, p.1276.
Adjustments by author.

TABLE 2
ESTIMATED REVENUE RECEIPTS FOR ELEMENTARY AND SECONDARY SCHOOLS, PERCENT DISTRIBUTION BY LEVEL OF GOVERNMENT, SELECTED YEARS

	1982-83*			1979-80			1969-70		
	Fed.	State	Local	Fed.	State	Local	Fed.	State	Local
U.S. Avg.	7.4	50.3	42.3	9.2	48.9	42.0	7.2	40.9	51.8
California	5.7	78.3	16.0	9.7	71.2	19.1	5.3	37.3	57.4
Far West	5.9	78.1	16.0	9.5	67.3	23.2	5.6	38.6	58.8

Source: Advisory Commission on Intergovernmental Relations, Significant Features of Fiscal Federalism 1982-83 Edition , January 1984, Table 21, p. 28.

TABLE 3
TOTAL REVENUES FOR K-12 EDUCATION
AS A PERCENT OF STATE PERSONAL INCOME
1983-84 AND 1984-85

	1983-84 (Estimated)	1984-85 (Projected)
Revenue	$Millions	$Millions
Total K-12 Revenue	$13,732.1	$15,603.8
Federal	1,002.2	1,082.6
Total State/Local	12,729.9	14,521.2
State Pers. Income	$375,600	$459,200
Revenue as Percent of Projected Income	Percent	Percent
Total K-12 Revenue	3.66	3.40
Federal	0.27	0.24
Total State/Local	3.39	3.16

Sources: Revenue data from: Legislative Analyst, Summary of Legislative Action on the Budget Bill 1984-85 Fiscal Year , Table 6, p.15.
Personal income data: UCLA Business Forecasting Project, "The UCLA Business Forecast for California," September 1984, p.14

California Total State and Local Tax Revenues

Revenue generation has not kept pace with the growth of personal incomes in California. As depicted in Table 4, this has been the pattern not only in this state but in the West and the nation as a whole. However, the ratio of revenues to state personal incomes has fallen considerably more rapidly in California than in the U.S. as a whole. In 1978, total state and local tax revenues in California were 15.80 percent of personal income and by 1980 had fallen to 12.17 percent. Thus, while in 1978 California's ratio of tax revenues to personal income had been 23.9 percent above the national average, the percent by which California exceeded the nation as a whole fell to 5.3 percent by 1980 and 1.8 percent by the following year.

The above trend in the ratio of revenues to state income is reflected in the relationship between general expenditure and state income as well. Table 5 displays California direct general expenditure as a percent of state personal income in the period just prior to as well as after the passage of Proposition 13. While general expenditures as a percent of personal income fell for the nation as a whole, the effect was more pronounced in California. For example, where California's ratio was 9.6 percent above that for the U.S. in 1978, it fell to 98.7 percent of the U.S. ratio in 1979.

The major conclusion reached is that in the recent past California's tax revenues, and consequently expenditures, have not risen as rapidly as state personal income. This has been true not only for education - further detailed estimates are provided in the section on revenue projections - but for state and local revenues in general. While this is in part a reflection of Proposition 13, it should be noted that it is part of a national trend, although considerably more pronounced in California.

TABLE 4
STATE AND LOCAL TAX REVENUE AS A PERCENT OF STATE PERSONAL INCOME

Year	Calif.	Far West	U.S.	California as % of U.S.
1975	14.59	14.07	12.29	118.7
1978	15.80	15.13	12.75	123.9
1980	12.17	11.91	11.57	105.3
1981	11.49	11.30	11.29	101.8
1982	11.12	10.99	10.96	101.4

Source: Advisory Commission on Intergovernmental Relations, Significant Features of Fiscal Federalism 1982-83 Edition , January 1984 Tables 29.1, 29.2, pp. 41-42.

TABLE 5
STATE AND LOCAL DIRECT GENERAL EXPENDITURE AS A PERCENT OF STATE PERSONAL INCOME

Year	Calif.	U.S.	California as Percent of U.S.
1976	22.06	20.32	108.6
1978	21.29	19.43	109.6
1979	18.83	19.08	98.7
1980	19.04	19.03	100.1
1981	19.15	18.72	102.3
1982	18.17	17.84	103.1

Source: Advisory Commission on Intergovernmental Relations, Significant Features of Fiscal Federalism 1982-83 Edition , January 1984, Tables 9.1, 9.2, and earlier editions.

THE PROJECTIONS

The sections which follow provide projections of key series impacting on revenue generation and on the "need" for particular levels of expenditure. The projections were developed using a number of different sources and through the use of different methods ranging from the use of simple ratios between series to the use of sophisticated econometric models. The sources are noted at the foot of each table.

Population

Population projections are available from a variety of sources. While movements over time between population cohorts within California may be projected with little uncertainty, migration patterns lead to significant uncertainties. This is compounded by the possible changes in immigration legislation.[4] Earlier estimates and projections of California's population during this decade were devloped by the MIT/Harvard Center for Urban Studies.[5] Current estimates and projections are provided for 1980, 1985 and 1990 by the California Department of Finance (see Table 6). Both UCLA and the Pacific Gas and Electric company provide projections on an annual basis.

From Table 6 it may be seen that the total population of California is projected to grow by about 4.2 million people during the 1980 decade. The growth, however, is far from uniform by age groups. During the first half of the decade, the school aged population (age 5-17) is projected to fall about 1.11 percent, while the major age group of college attendees is projected to have about half that percentage drop. The elderly (aged 65 and over), on the other hand, are projected to grow by about 16 percent. This should be reflected in a greater "need" for services used disproportionately by the elderly (such as health and hospitals) and a decline in the "need" for services for the youth (such as schooling). This is in fact mirrored by the changing emphasis in the state budget as discussed in the section on competing services.

In the second half of the decade, however, the school aged population is projected to increase by 9.8 percent, while the "college age" population is projected to decline by about 7.7 percent. This is reflected in the increase in enrollments projected by the Department of Education. What will happen to enrollments in the University of California, the California State University, as well as the Community Colleges of California is less clear. Community College enrollments are down, but the University of California as well as the California State Universities are no longer faced, as they were in recent years, with the imminent prospect of the closure of several campuses due to low enrollments. Policies to encourage the enrollment of older students, as well as tuition policies can alter the number of applicants and enrollees in UC and the

TABLE 6
CALIFORNIA POPULATION BY SELECT AGE GROUPS
(In Thousands)
1980, 1985, AND 1990

Population Cohort	Actual Population 1980	Projected Population 1985	1990	Percent Change 1980-85	1985-90
Total	23,771	25,998	27,990	9.37%	7.66%
Age 5-17	4,698	4,646	5,102	-1.11	9.81
(% of Total)	(19.8%)	(17.9%)	(18.2%)		
Age 18-24	3,299	3,280	3,028	-0.58	-7.68
(% of Total)	(13.9%)	(12.6%)	(10.8%)		
Age 65 & Over	2,427	2,817	3,297	16.07	17.04
(% of Total)	(10.2%)	(10.8%)	(11.8%)		

Source: Computed from data in California Department of Finance, Population Projections for California Counties 1980-2020... , October 1983.

CSU. It is not anticipated that the significant drop in the "college aged" population will be reflected in a proportionate drop in UC and CSU enrollments.

Table 9 in a later section projects that K-12 enrollments "bottom out" in 1984 and will increase from then on through the end of the decade. ADA, only slightly less than enrollments generally, is expected to follow this same pattern.

Personal Income

Short run economic activity forecasts for California are available from a variety of sources including several of the major banks, UCLA, and the California Department of Finance (a review of 1984 forecasts is presented in the Report of the Legislative Analyst, "The 1984-85 Budget: Perspectives and Issues," Table 28, p.73). The UCLA Business Forecasting Project provides short range forecasts using an econometric model of California containing some 200 simultaneous equations. This California model is used in conjunction with the Data Resources Quarterly model of the U.S. economy which contains some 800 simultaneous equations. The output of the California quarterly model includes income, price levels, population, employment, and other economic indicators. The UCLA short range forecasts for personal income and the California Consumer Price Index are displayed in Table 7, along with data for the recent past and forecasts generated by Pacific Gas and Electric's CAMS Model forecasts for the same variables. Because different base periods are used in various forecasts, all indices and constant dollar amounts were converted by the author to constant 1972 dollars. While differences exist between the two sets of short range forecast shown, the consistent pattern is for a continued expansion in California personal income to grow significantly both in current and constant dollar terms. Moderate rates of inflation are forecast in both sets of projections.

Pacific Gas and Electric's Economics and Statistics Department develops long range forecasts.[6] Table 8 displays the long range forecasts of California Personal Income and the Consumer Price Index. Real 1984 personal income is projected to be 2.6 percent above that for 1983, while 1990 real income is projected to be 21 percent above that for 1984. These income data will be used in developing our projections of school revenue growth.

Enrollment and Average Daily Attendance

As discussed earlier, the population projections contained in Table 6 forecast a fall in the school aged population in the first half of the decade and a growth in the second half which exceeds the general population growth. This should, of course, be reflected in increased public school enrollments. The projections of K-12 enrollments in Table 9 by the California

TABLE 7
SHORT RANGE FORECASTS
CALIFORNIA STATE PERSONAL INCOME 1976 - 1986
IN CURRENT AND CONSTANT DOLLARS (1972=100)
(BILLIONS)

Year	Personal Income Current $ ($Billions)	Personal Income Constant 1972 ($Billions)	Calif. CPI Price Index (1972 = 100)
1976	156.9	115.8	135.5
1977	175.7	122.5	143.4
1978	200.7	130.8	153.4
1979	229.3	137.1	167.3
1980	259.6	140.9	184.2
1981	292.1	146.2	199.8
1982	311.0	147.2	211.3
	UCLA PGE	UCLA PGE	UCLA PGE
1983*	331.8 (334.6)	151.1 (153.2)	219.6 (218.4)
1984**	375.6 (369.3)	165.7 (161.5)	226.7 (228.7)
1985**	416.6 (399.2)	177.5 (165.7)	234.7 (240.9)
1986**	459.2 (433.4)	187.3 (170.2)	245.2 (254.6)

*Estimated
**Forecast

Sources: 1976-82 and UCLA columns 1983-86: UCLA Business Forecasting Project, "The UCLA Business Forecast for California", September 1984, p.14.
Price index imputed by author.
1983-86 PGE Column: Pacific Gas and Electric Company. These data are provided courtesy of PGE for use in forecasting school revenues and are not necessarily those used in PG and E's official planning on rate analysis.

TABLE 8
LONG RANGE FORECASTS
CALIFORNIA STATE PERSONAL INCOME 1976 - 1990
IN CURRENT AND CONSTANT DOLLARS (1972=100)
(BILLIONS)

Year	Personal Income Current $ ($Billions)	Personal Income Constant 1972 ($Billions)	Calif. CPI Price Index (1972 = 100)
1976	156.9	115.8	135.5
1977	175.7	122.5	143.4
1978	200.7	130.8	153.4
1979	229.3	137.1	167.3
1980	259.6	140.9	184.2
1981	292.1	146.2	199.8
1982	311.0	147.2	211.3
1983*	334.6	153.2	218.4
1984**	369.3	161.5	228.7
1985**	399.2	165.7	240.9
1986**	433.4	170.2	254.6
1987**	473.6	175.9	269.2
1988**	518.8	182.2	284.8
1989**	569.0	188.7	301.5
1990**	625.3	195.5	319.8

*Estimated
**Forecast

Sources: 1976-82: UCLA Business Forecasting Project, "The UCLA Business Forecast for California", September 1984, p.14. Price index imputed by author.

1982-1990: Pacific Gas and Electric, Economics and Statistics Department. Note these forecasts are not necessarily those used in PG and E's official planning on rate analysis. Information provided for use in forecasting school revenues. Price indices converted to 1972 = 100 by author.

Department of Education are consistent with this expectation. After 1984, enrollments and consequently ADA are projected to grow each year throughout the decade. Enrollments in 1990 are expected to be about 565,000 students or 13.9 percent above 1984 enrollments.

Average daily attendance data and projections in Table 9 closely mirror enrollments, since California's ADA and enrollments rarely differ by much more than 1.0 percent. The projections are based on the 1983 ratio of ADA to enrollments of 0.9897.

Teacher Requirements

While many districts will continue to face declining enrollments, and consequently need to lay off teachers, the increased student population in the second half of the decade will require a significant increase in the number of K-12 teachers, unless of course, the ratio of students to teachers is to increase further. In 1983 the ratio was 23.9 to 1 in California while the national average was 17.1 to 1.[7] It should be noted that not only is the ratio of students per teacher in California about 40 percent above the national average, California had the highest ratio of all of the states. While increasing this ratio is a policy option, it is likely to be met with major resistance. It is more likely that there will be pressures to move California toward the national average. The last column in Table 9 shows the number of teachers that would be required were California to move to the national average ADA/teacher ratio.

K-12 Revenues

As seen from Appendix Table 2, K-12 revenues consist primarily of state generated funds (65.9% for 1984-85) and secondarily of locally generated revenues (27.2%), with the federal government responsible for the remainder (6.9%). Conceptually, a revenue generation model might appear as below:

1) REVNUE = FEDREV + STAREV + LOCREV
2) FEDREV = f(NATINC)
3) STAREV = g(STAINC)
4) LOCREV = h(PROP)

Where:
- REVNUE = Total K-12 revenues
- FEDREV = Revenues for K-12 received from the federal government
- STAREV = State generated K-12 revenues
- LOCREV = K-12 revenues generated by local property taxes
- NATINC = U.S. (National) personal income
- STAINC = California personal income
- PROP = Property tax base (assessed value)

TABLE 9
K-12 ENROLLMENTS AND ADA WITH PROJECTIONS THROUGH 1990

Year	K-12 Enrollments (1000's)	K-12 ADA* (1000's)	K-12 ADA (Incl'g Adult) 1000's	Teachers Required** at 1983-84 Calif. Ratio (1000's)	Teachers Required** at 1983-84 U.S. Ratio (1000's)
1980	4048	4055	4206		
1981	3959	4043	4214		
1982	4065	4045	4201		
1983	4088	4046	4230		
1984	4051	4009	4281	167.9	234.7
1985	4119	4077	4347	170.7	238.7
1986	4202	4159	4434	174.2	243.5
1987	4288	4244	4525	177.7	248.5
1988	4375	4330	4617	181.3	253.5
1989	4483	4437	4731	185.8	259.8
1990	4616	4568	4870	191.3	267.4

* Excludes adult ADA.
** Based on ADA not including adult ADA.
Sources: Enrollments: 1980: U.S. Office of Education, Digest of Educational Statistics (annually) . 1981-83: National Education Association, Rankings of the States (Annually) .
1984-1990: California Department of Education, 1984 actual, 1985-1990 projected.
ADA: 1984-90: Estimated by author using 1983 ratio of ADA to enrollments (0.9897).
Teacher requirement based on student-teacher ratio, California and U.S. average, 1983-84.

A revenue generation model could be specified as above with separate equations for each level of revenue generated. However, local property taxes raised are ultimately paid from received incomes, federal incomes and state incomes are highly collinear, and state revenues are dominant. (On this latter point, see Appendix Tables A1 and A2). Given these considerations, the revenue generation model may be respecified more simply as:

5) REVNUE = r(STAINC)

If the functional relationship between state personal income and K-12 revenue is stable, then revenue projections can be based on projections of state personal incomes. The methodology adopted here is to estimate the income elasticity of revenues for K-12 education for the recent past-specifically, for the post-Proposition 13 era. Given that personal income projections are available from a number of economic models of California, the income elasticities and income projections can be combined to project revenues. Since the responsiveness of K-12 revenues to state personal income varies with the period selected for estimation of responsiveness, several alternative projections are provided.

Table 10 provides estimates of the income elasticity of K-12 school revenues in the period following the passage of Proposition 13, the constitutional amendment which conditions California's revenue generating capability for schools as well as other revenues. Following standard economic and statistical practice, the elasticity is computed at the midpoint of the increment in income and revenue. Thus, as noted in the table, the percent change is based on the average of the beginning and terminal values of revenue and income.

Two separate estimates of income elasticity are provided. The first is based on state personal income and K-12 revenues over the period 1979-80 through the last school year completed, 1983-84. The second is based on changes from 1981-82 through the present school term. This latter period exhibits a greater responsiveness and may reflect an adjustment following the initial post Proposition 13 period. Further, in this latter case revenues are based on the amounts enacted in the current year's budget act, while personal income is based on a short range forecast. The earlier terminal year provides income and revenue data with a smaller expected error; however, the later terminal year has the advantage of taking into account estimates of more recent changes. Both yield estimates of income elasticity of revenues which are below 1.000 (0.610 and .919, respectively). This implies that revenues for K-12 education have grown at a slower pace than state personal income, such that the ratio of K-12 revenues to state personal income falls over time.

To be sure, the choice of time period is somewhat

TABLE 10
ESTIMATION OF INCOME ELASTICITY OF K-12 SCHOOL REVENUES

Year	K-12 Revenue ($Millions)	State Personal Income ($Billions)
1979-80	$10,981.6	$259.6
1983-84	13,732.1	375.6
Change	2,750.5	116.0
% Change*	22.26%	36.52%

Income Elasticity = 22.26 / 36.52 = 0.6095

1981-82	$11,929.8	$311.0
1984-85	15,603.8	416.6
Change	3,674	105.6
% Change*	26.69%	29.03%

Income Elasticity = 26.69 / 29.03 = 0.9194

* % change based on average of beginning and terminal year revenue and income.
Source of data: see Table 1.

arbitrary. Very short periods, such as from one year to the next, would not be indicative of a trend and would be inappropriate for long term forecasts. A very long period of time may give undue weight to early periods which may not reflect later changes. The period from 1982-83 to the present reflects the period of educational reform efforts and thus would reflect a higher responsiveness to personal income change. It is not at all certain that the elasticity estimates for this reform period will be sustained through the end of the decade. Thus, our second elasticity estimate is based on including an earlier year (1981-82) as well. It should be noted that the 1982-83 through 1984-85 period would also have yielded an elasticity estimate below 1.000.

The two estimates of income elasticity of revenues, 0.610 and .919, together with an assumed value of unit elasticity (1.000), are used for making three projections of K-12 revenues, given the previously discussed projections of personal income. Table 11 presents the revenue projections through 1990. If no major changes are instituted in the revenue structure for K-12 education, the projections based on the recent historical relationship between income and revenues are expected to yield between $20.6 billion and $23.6 billion by 1989-90.

If changes are implemented such that the ratio of revenue to income remains fixed at that estimated for the current school year, then a larger estimated amount of revenues would be generated ($24.4 billion by 1989-90). It must be emphasized that this is not a likely outcome unless changes are implemented which significantly alter the recently recorded relationship between California's personal income and K-12 revenues. The two lower sets of projected revenues are viewed as likely outcomes based on the current structure.

Given that revenue adequacy involves a consideration not only of total revenues but the amount available per child, as well as the purchasing power of these revenues, several adjustments must be made. Table 12 displays K-12 revenues per student in ADA both in current dollars and in constant 1972 dollars. Actual values are provided for 1975-76 through 1983-84; 1983-84 values are estimated based on preliminary information, while 1984-85 data are based on the current year's budget act and are thus subject to modest change. Three sets of projections are again provided for the remaining years through 1989-90 based on the three values for income elasticity discussed above.

Under all three sets of assumptions revenues per student (dollars per ADA) are projected to increase. Although ADA is projected to increase in the second half of the decade, revenues are projected to increase more rapidly. However, the same is not as likely to occur in real terms (after price increases are adjusted for).

TABLE 11
REVENUES FOR K-12 EDUCATION WITH PROJECTIONS THROUGH 1990
BASED ON THREE ALTERNATIVE INCOME ELASTICITIES

Year	Total Funding (Millions)
1975-76	$7,588
1976-77	8,655
1977-78	9,517
1978-79	9,426
1979-80	10,982
1980-81	11,733
1981-82	11,930
1982-83	12,593
1983-84*	13,732
1984-85**	15,604

	Projections with income elasticity of revenue equal to:		
	0.6095	0.9194	1.000
1985-86	16,419	16,833	16,941
1986-87	17,347	18,269	18,512
1987-88	18,356	19,872	20,279
1988-89	19,438	21,639	22,241
1989-90	20,611	23,608	24,442

* Estimated
** As enacted

Source: 1975-76 through 1984-85, see Table 1. See text for discussion of income elasticity of revenue.
0.6095 estimated from 1979-80 through 1983-84 income and revenues. 0.9194 is estimated using the years 1981-82 through 1984-85.
1.000 assumes unit elasticity, or fixed ratio between state personal income and K-12 revenues.

TABLE 12
TOTAL REVENUES FOR K-12 EDUCATION PER STUDENT (ADA) WITH PROJECTIONS THROUGH 1990: IN CURRENT AND CONSTANT 1972 DOLLARS

Year	Total Funding Per ADA: Current Dollar Amount	Total Funding Per ADA: Constant 1972 Dollars
1975-76	$1650	$1218
1976-77	1834	1279
1977-78	2045	1333
1978-79	2207	1319
1979-80	2611	1417
1980-81	2784	1393
1981-82	2840	1344
1982-83	2977	1363
1983-84*	3208	1403
1984-85**	3590	1490

Projections with income elasticity of revenue equal to:

	0.6095		0.9194		1.000	
	Current Dollars	1972 Dollars	Current Dollars	1972 Dollars	Current Dollars	1972 Dollars
1985-86	$3,703	$1,454	$3,796	$1,491	$3,820	$1,500
1986-87	3,834	1,424	4,037	1,500	4,091	1,520
1987-88	3,976	1,396	4,304	1,511	4,393	1,542
1988-89	4,109	1,363	4,574	1,517	4,701	1,559
1989-90	4,232	1,323	4,847	1,516	5,018	1,569

* Estimated
** As Enacted
Note: See text for discussion of deflation. California CPI used throughout for constant 1972 dollar amounts shown above.
Source: 1975-76: See Table 1. 1985-86 through 1989-90, see Table 11 and text discussion.

It is necessary to comment at the outset on the adjustments made in developing the constant 1972 dollar amounts. Conceptually, what is desired is an estimate of the changes in the costs of a fixed set of typical resources used in K-12 education. This would involve such measures as the cost of hiring teachers with a given set of qualifications, the costs of other personnel (again with a given set of qualifications), and the costs of supplies and services and other inputs used or employed to produce K-12 education. Currently, such estimates do not exist for the U.S. or California. For the U.S. as a whole there is an index of the costs of government services, specifically the Gross National Product implicit price deflator for state and local purchases of goods and services. This is the measure used in the California Legislative Analyst's conversions of current dollar to constant dollar magnitudes as reported in Table 1. However, this index has numerous flaws, chief among which is the fact that it is based on the U.S as a whole. The alternative is to use a California specific index. This is the approach adopted here. The personal income data and revenue data are converted in our data series and projections using actual or projected California CPI. This index is specific to California, but not specific to educational resource costs. The choice between this index and the U.S. state and local government deflator is not critical as the two series closely track one another. The conclusions reached are not sensitive to this choice of cost index.

In viewing the projected constant dollar revenues per ADA, real revenues per student fall consistently throughout the remainder of the decade. Using the lower estimate of income responsiveness, the 1989-90 real revenues per ADA are estimated to be $167 below that for the 1984-85 school year, as based on the amount enacted. This amounts to an estimated reduction in revenues per student of 11.2%. Under the more favorable assumption of a revenue elasticity of 0.919, real revenues per student are expected to increase by only $26 or 1.7%. Thus, under the assumption that revenues will have the same responsiveness to income growth as in the recent past, the expansion in total K-12 revenues is likely to be entirely or largely offset by increased student enrollments (and consequntly ADA) and the moderate rates of inflation projected through 1990.

Under the more expansionary projection made, based not on recent estimated relationships but rather on the assumption that K-12 revenues will grow as rapidly as personal incomes in the state, real spending per student would increase $79 or 5.3% over the next five years. It must be emphasized that this growth is not expected, it merely serves as a "limiting case" were revenues to grow as rapidly as the state's fiscal capacity measured by income growth. Except for a one to two year period between fiscal 1983 and 1985, the revenue income relationship of the recent past as well as that of the past decade and a half do not lead to such optimism concerning revenue growth.

To summarize, the revenues have been projected by:

- estimating the responsiveness of revenues to state personal income growth (income elasticity of revenues)
- projecting state personal incomes through 1990
- projecting the number of public school students (ADA)
- projecting a price index (California CPI) through 1990
- using the projections of ADA and CPI to project constant 1972 dollar revenues per student (ADA)

The conclusion reached is that real revenues per student are expected to either fall or to rise only very modestly throughout the remainder of the decade unless the revenue structure is significantly altered. This conclusion is supported using an alternative measure of revenues per student developed in the Addendum.

Expenditures

As stated earlier, expenditure projections consist not of forecasting what expenditures are expected to be, but rather what expenditures would be if certain objectives were to be met. It is the availability of revenues which conditions the actual level of expenditures. At issue then are some of the alternatives to be met.

Several alternatives were considered in a recent study.[8] These consisted of increasing teacher pay, reducing the student teacher ratio and increasing the time spent in school by increasing the length of the school day and/or increasing the length of the school year. The costs for the individual "improvements" ranged between $0.00 and $1.5 billion dollars for reducing the student-teacher ratio to the nation's average. Several alternatives are addressed below.

If we assume that the real expenditure per ADA is kept constant (costs rise at the rate of general inflation), then the only increase in costs would be due to the increased number of students. Then, given the price indices presented in Table 8, current dollar expenditures can be projected. The results of this exercise are presented in Table 13 below.

Thus, it is projected that to maintain the status quo in terms of per student real term spending, current expenditures

TABLE 13
EXPENDITURES REQUIRED TO KEEP REAL EXPENDITURES PER ADA AT THE 1983-84 LEVEL

Year	Per ADA K-12 Expend. 1972 $'s	ADA (1000's)	Total K-12 Expend. 1972 $'s	Total K-12 Expend. Current $'s
1983-84	$1403	4281	$6,006	$13,736
1984-85	"	4347	6,099	14,692
1985-86	"	4434	6,221	15,839
1986-87	"	4525	6,349	17,092
1987-88	"	4617	6,478	18,449
1988-89	"	4731	6,638	20,014
1989-90	"	4870	6,833	21,852

Note: See text for assumptions

must rise by about 59 percent between 1983-84 and the end of the decade. From the revenue projections in Table 11, it may be seen that revenues are expected to grow by only 50 percent under the assumption of the lower estimated income elasticity (0.610) and by about 72 percent under the more responsive income elasticity estimate (0.919). In other words, under the former assumption revenues do not permit the maintenance of the status quo, while in the latter case, revenues are estimated to increase at a pace slightly faster than that consistent with maintaining the same level of spending per student. However, few improvements can be provided for. Efforts to increase teacher salaries in real terms, to reduce student faculty ratios, or to provide for substantially higher resources per student would not be consistent with our estimates of the growth of revenues.

Total General Fund Tax Revenues

The State has major revenue commitments to other programs, including higher education, public welfare, highways, and health and hospitals, which are heavily funded by state sources. Recent revenue and expenditure patterns for these functions are presented in Tables 16-18 and Appendix Table 3.

In order to better understand the potential limiting impact of competing programs on revenues for K-12 education, projections were made of the growth in total state general fund tax revenues through 1990. The procedure followed was the same as that employed in generating estimates of K-12 revenues. The recent trends in tax revenues and state personal incomes were examined and income elasticities computed for state general fund tax revenues using the same base and ending periods as in the estimates for K-12 revenues. These elasticity estimates are displayed in Table 14. In comparing these results with those for K-12 revenues, it may be seen that general fund tax revenues were moderately more responsive to state income growth than were K-12 revenues. However, like the case for K-12 education, both estimates were less than unity (0.709 and 0.918). Thus, the ratio of tax revenues to state income fell during the periods used in developing the estimates.

Given the projections of state personal incomes (see Table 8) together with three alternative measures for income elasticity, projections of general fund tax revenues were made through 1990. These are shown in Table 15. While tax revenues are projected to increase by 58%, 73%, or 79% from 1983-84 to 1989-90 depending on the elasticity measure used, real growth per capita is much more modest. After adjusting for projected inflation and population growth (PG and E population projections and inflation forecasts, as adjusted by the author, were used), tax revenues in constant 1972 dollars per capita were projected to increase from $376 in 1983-84 and $401 as budgeted for 1984-85 to $386, $408, or $438 by 1989-90. Given our lower estimate of elasticity this amounts to a decline in

TABLE 14
ESTIMATION OF INCOME ELASTICITY OF CALIFORNIA GENERAL FUND TAX REVENUES

Year	General Fund Revenue ($Millions)	State Personal Income ($Billions)
1979-80	$16,860	$259.6
1983-84	21,875	375.6
Change	$5,015	$116.0
% Change*	25.89%	36.52%

Income Elasticity = 25.89 / 36.52 = 0.7090

1981-82	$19,109	$311.0
1984-85	24,982	416.6
Change	5,873	105.6
% Change*	26.64%	29.03%

Income Elasticity = 26.64 / 29.03 = 0.9178

* % change based on average of beginning and terminal year revenue and income.
Source of data: See Table 1 and Governor's Budget Summary 1984-85 , p.72.

real per capita tax revenues, while the higher estimate yields a modest 5.5% increase over the revenues projected for 1984-85.

Assuming unitary income elasticity yields a $37 or 9.2 percent increase over that anticipated for 1984-85. Given that this latter figure was not based on estimated elasticity but developed under the assumption that tax revenues increase at the same percentage rate as state income, it is to be expected that real tax revenues per capita will not increase substantially through the end of the decade over the levels expected for the next year and may even decline slightly. For this reason it is useful to examine the relative importance and trends in other programs using state funds which will be competing with elementary and secondary education.

TABLE 15
CALIFORNIA GENERAL FUND TAX REVENUES WITH PROJECTIONS THROUGH 1990 BASED ON THREE ALTERNATIVE INCOME ELASTICITIES

Year	Total General Fund Tax Revenue ($Millions)
1975-76	$9,069
1976-77	10,781
1977-78	12,952
1978-79	14,188
1979-80	16,860
1980-81	17,808
1981-82	19,109
1982-83	19,579
1983-84*	21,875
1984-85**	24,982

Projections with income elasticity of tax revenues equal to:

	0.7090	0.9178	1.000
1985-86	26,499	26,950	27,122
1986-87	28,242	29,248	29,638
1987-88	30,153	31,814	32,466
1988-89	32,222	34,645	35,608
1989-90	34,482	37,796	39,131

* Estimated
** As enacted

Source: 1975-76 through 1984-85: Governor's Budget Summary 1984-85 , p.72.
See Table 14 and text for discussion of income elasticity of tax revenues. 0.7090 estimated from 1979-80 through 1983-84 income and tax revenues. 0.9178 is based on the period 1981-82 through 1984-85.
1.000 assumes unit elasticity, or fixed ratio between state personal income and state general fund taxes.

PROGRAMS COMPETING FOR STATE REVENUES

Thus far, our focus on projecting revenues has been on K-12 education. It was concluded that, given estimates of the responsiveness of educational revenues to state income changes, projected real K-12 revenues per student would be likely to either decline for the rest of the decade or to increase only modestly. Yet, there is widespread consideration being given to improving the quality of public K-12 education through a variety of programs, few of which can be costless, and several which involve major increases in resources. Where are the likely increases in revenues to be generated? If it is likely that state tax revenues were to grow substantially in real terms per capita, or that other program "needs" were to diminish over time, a solution would be easier to achieve. The estimates provided earlier projected either a decline or very modest increase in real per capita revenues. What might be said for the expected growth in "needed" expenditures for other programs funded in large part by state generated tax revenues?

Table 16 displays trends in state and local revenues and expenditures while Appendix Table 4 shows the relative importance of major programs. As a percent of personal income the major programs have either fallen as a proportion of personal income from 1977 through 1982 or have maintained a fixed ratio. The decline in California has been considerably greater than that for the nation as a whole.

Spending for education, welfare, and highways has fallen as a proportion of total state-local spending in California, while health and hospital spending has increased in relative importance. This is due in part to the costs of health care rising more rapidly than other costs, and in part to the increase in the elderly population which requires more medical care than younger population groups.

Population projections by age group indicate a significant decline is to be anticipated in the population between the ages of 18 and 24. It is anticipated that this will result in a reduced "demand" for post-secondary higher education. The California Community Colleges have already experienced major declines in enrollments, while the same has not been the case for the University of California and the California State University. The expected declines in college age population, in all likelihood, will not be reflected in proportionate declines in enrollments in each of the three systems of public higher education. The University of California is currently experiencing a record high enrollment demand, and the CSU enrollments show little sign of declining. What happens to enrollments in these two systems will depend in part on the fees charged. Both have fees far below comparable private institutions. Holding the line on fee increases would be expected to shift enrollment demand from the private colleges to UC and the CSU. The imposition of a modest fee at the

TABLE 16
CALIFORNIA STATE AND LOCAL GENERAL REVENUES AND EXPENDITURES AS A PERCENT OF STATE PERSONAL INCOME, SELECTED YEARS

General Revenue	1982	1980	1977	1972	1967
U.S. State and Local	18.8%	19.8%	20.8%	19.5%	15.7%
California	18.9	20.2	23.6	22.5	18.1
Direct Gen'l Expend.					
U.S. State and Local	17.9%	19.0%	20.0%	19.7%	16.1%
California: Total	18.2	19.0	21.8	21.3	18.9
Education	6.1	6.6	7.9	7.4	6.8
Public Welfare	3.1	3.0	3.9	4.1	2.5
Highways	0.8	1.0	1.0	1.7	2.1
Health/Hospitals	1.6	1.6	1.6	1.4	1.2
Calif. Functions as a Percent of Total					
Education	34%	35%	36%	35%	36%
Public Welfare	17	16	18	19	13
Highways	4	5	5	8	11
Health/Hospitals	9	8	7	7	6

Source: Advisory Commission on Intergovernmental Relations, Significant Features of Fiscal Federalism 1982-83 Edition , January 1984, p.144. Computations by author.

Community College level may have been responsible in part for their enrollment decline and some increase in enrollment demand in the other two systems of higher education.

With deferred maintenance and deferred construction having occurred in both the UC and CSU during the past decade, added expenditure demands are expected to continue for several years. Furthermore, salaries in both systems have fallen behind comparison institutions. These factors together with the anticipated stability in enrollment demand imply that revenue claims will not decline in the next several years. Table 17 displays the sizeable increase anticipated in state aid to post-secondary education from 1983-84. While the total support budget is expected to grow about 15 percent in the period, capital outlays are expected to increase by over 400 percent.

Real per capita state tax revenues are expected to decline modestly from the level expected for 1984-85 or to increase only slightly. It is unlikely that the expenditure demand will be significantly reduced from post-secondary education, particularly from the UC and CSU systems. Health and hospital expenditures will likely experience a continued increase as the elderly increase in absolute and relative numbers and medical costs continue to inflate at rates above that for other goods and services. The remaining major competing expenditure demand is welfare. With both the young and the elderly increasing in numbers, it is likely that expenditures for these programs will continue to rise. Policy changes to reduce payment levels or a major improvement in the economic condition of the poor could result in lower expenditures but neither condition can be anticipated. The overall conclusion reached is that any increased expenditure demand to improve K-12 education will not be met with an expected increase in state revenue growth or reduction in the expenditure demand from major competing programs.

CAVEATS AND LIMITATIONS

The elasticity measures used have been derived from past observed behavior. It must be borne in mind that the revenue structure and the division of revenues among competing programs is subject to change by legislative action or voter behavior. Thus, the projections here, as is the case for most projections, assume that the structure will remain fixed over the projected period, or that structural changes will be systematic and predictable. Further, it should be noted that differences in either the beginning or terminal year for computing the income elasticity of revenues will result in different estimates. The estimated elasticities used are based on a judgement of the likely range. The earlier interval includes all years in the post-Proposition 13 era through 1983-84. The second includes the period 1981-82 through 1984-85 during which it may be argued that the revenue structure has adjusted to the initial effects of Proposition 13, and includes the current fiscal year as well. The estimates based on an

TABLE 17
TOTAL STATE AID TO POSTSECONDARY EDUCATION
1983-84 AND 1984-85

Support Budget (Million's)	1983-84 Estimated	1984-85 Budget Act	Change From 1983-84 Amount	Percent
Univ. of Calif.	$1,124.6	$1,374.7	$250.1	22.2%
Calif. State Univ.	1,003.1	1,205.2	202.1	20.2
Calif. Comm. Coll.	1,072.8	1,101.5	28.7	2.7
Other Post Second.	178.4	206.2	27.8	15.6
TOTAL SUPPORT	$3,378.9	$3,887.7	$508.7	15.1%
Capital Outlay Budget ($Millions)				
Univ. of California	$7.1	$110.4	$103.2	1444.6%
Calif. State Univ.	11.3	25.3	14.0	124.1
Calif. Comm. Coll.	7.4	25.0	17.5	235.6
Other Post Second.	--	0.7	0.7	*
TOTAL: CAPITAL OUTLAY	$25.9	$161.3	$135.4	423.6%

* Infinite percentage increase.

Source: Legislative Analyst, Summary of Legislative Action on the Budget Bill 1984-85 , Table 8, p. 18.
Computations and Corrections by author.

elasticity of 1.00 provide a set of projections where the ratio of revenues to state income remain fixed.

The current and past revenue data presented in this paper are the widely used series from the Legislative Analyst's Office. These data were selected because they are used by the state's decision makers - the legislature and the governor, other school finance researchers - and because the Analyst's Office has earned respect for its nonpartisan analyses and recommendations. The data are not without limitations, however. Certain revenues, such as Adult Education and those for the Office of Private Post-Secondary Education, are for purposes which may not directly benefit K-12 students. Others, such as the state payment to State Teachers Retirement System (STRS), vary dramatically from year to year and, as such, may result in errors in projecting general trends.

In order to examine the sensitivity of our analysis and conclusions to these data problems, a modified measure of revenues per K-12 ADA was developed. The results of the analysis are provided in the Addendum which follows. The overall conclusions of this paper are supported. That is, the funding outlook is no more encouraging than originally projected. It is of interest to note that those revenues considered "strictly" K-12 increased more slowly and were less responsive to growth in the economy than the selected measures which were removed from the Analyst's data in the revision.

Finally, the projections in this paper do not include estimates of the effects of the recently enacted state lottery. While it has been estimated that this program may raise about a half billion dollars for education, this does not mean that total revenus for schools will increase by this amount. Similar to the case for grants-in-aid, there may be significant "leakages," with lottery revenues serving as a substitute for other sources.

Addendum

AN ALTERNATIVE MEASURE OF K-12 REVENUES

Some observers of education policy assert that the Legislative Analyst's data for K-12 revenues and expenditures - those used in this paper - are "inaccurate" because they include items not strictly associated with K-12 education, or that some series fluctuate erratically. For example, some of the items that have traditionally been included in the Legislative Analyst's statements of total K-12 revenues include: adult education revenues, cafeteria fund revenues, state and local repayment of debt, internal transfers, and other miscellaneous revenues. Hence, the Analyst's K-12 data aggregation may cause K-12 revenues to be overstated for the purpose of determining how much money is actually spent on children enrolled in kindergarten through grade 12. Furthermore, while state payments to the State Teachers Retirement System (STRS) are a legitimate cost of K-12 education, the contribution has varied erratically in the recent past, and may result in errors in making K-12 revenue and expenditure projections. To respond to these criticisms and to see whether the conclusions reached are sensitive to the revenue measure used, the analyses performed in this paper were also applied to a modified measure of K-12 funding data.

To arrive at the modified revenue measure, the total revenues as reported by the Analyst were reduced by the amounts of revenues reported in the following categories:

1. Adult Education
2. Child Development (includes pre-school and child care)
3. State payment to STRS (this is the amount allocated to cover the system's unfunded liability and does not include district or teacher contributions)
3. Cafeteria fund revenues
5. State Library revenues
6. Office of Private Post-Secondary Education

The total ADA figures provided to the Legislative Analyst were reduced by the reported adult ADA figures. The modified funding and ADA figures are reported in Table 18. Generally, the revised revenues equal about 90 percent of the traditionally reported revenues. Of particular interest is the fact that while modified revenues increased by 90.8 percent between 1975-76 and 1984-85, the adjustments (or "non-K-12") revenues grew by 129.4 percent.

TABLE 18
DEVELOPMENT OF MODIFIED MEASURES OF K-12 REVENUES AND ADA

Year	Adult Education ($Thousands)	Child Development ($Thousands)	State Payments to STRS ($Thousands)	Additional Contributions to STRS ($Thousands)	Cafeteria Fund ($Thousands)	State Library ($Thousands)	Office of Private Post-Secondary Ed. ($Thousands)	Total Purged Revenues ($Thousands)
1974-75	8,866	91,706	135,000	43,348	272,796	11,263	915	563,894
1975-76	22,028	99,364	135,000	50,647	312,193	10,406	943	630,581
1976-77	95,507	117,014	144,300	100,994	338,133	10,150	1,125	807,223
1977-78	100,032	131,643	144,300	118,100	380,713	10,329	1,200	886,317
1978-79	136,356	153,746	144,300	128,800	399,833	14,416	1,442	978,893
1979-80	151,142	244,048	158,834	*	440,771	16,258	1,558	1,012,611
1980-81	156,600	237,588	222,206		447,491	17,317	2,183	1,083,385
1981-82	166,918	256,027	235,500		469,108	17,678	1,742	1,146,973
1982-83	151,687	253,482	235,500		494,996	19,475	1,903	1,157,043
1983-84	168,287	274,203	401,100		524,791	43,811	1,838	1,414,030
1984-85	191,612	288,922	369,100		555,000	37,555	2,434	1,444,623

Year	Total ADA	Adult ADA	Revised ADA (Total minus Adult)	Revenues All Sources ($Millions)	Purged Revenues ($Millions)	Adjusted Revenues ($Millions)
1974-75	4,710,177	71,488	4,638,689	7,395.4	563.9	6,831.5
1975-76	4,745,164	73,434	4,671,730	8,047.2	630.6	7,416.6
1976-77	4,736,100	226,000	4,510,100	8,843.0	807.2	8,035.8
1977-78	4,703,200	255,200	4,448,000	9,485.4	886.3	8,599.1
1978-79	4,271,181	163,366	4,107,815	9,425.6	978.9	8,446.7
1979-80	4,206,150	151,430	4,054,720	10,981.6	1,012.6	9,969.0
1980-81	4,214,089	171,054	4,043,035	12,117.4	1,083.4	11,034.0
1981-82	4,213,707	168,876	4,044,831	12,324.7	1,147.0	11,177.7
1982-83	4,229,628	157,459	4,072,169	12,489.3	1,157.0	11,332.3
1983-84	4,258,854	155,291	4,103,563	14,021.6	1,414.0	12,607.6
1984-85	4,337,687	162,615	4,175,072	15,596.2	1,444.6	14,151.6

*From 1979 on, additional contributions to STRS are included in state payments to STRS.

Sources:
1. Legislative Analyst, Analysis of the Budget Bill (for fiscal years 1974-75 to 1984-85).
2. State Controller, Annual Report of Financial Transactions Concerning School Districts and Community Colleges Districts of California (for fiscal years 1974-75 to 1984-85).

When modified revenues are divided by the modified ADA figures (Table 19), the bleak picture presented in Table 1 worsens. Whereas the total funding per ADA increased by 12.7 percent between 1975-76 and the present (in constant 1972 dollars), the modified funding per adjusted ADA increased by only 9.4 percent in the same period. These data may suggest that a disproportionate portion of the decade's increases to K-12 funding are being allocated to programs that do not directly benefit the K-12 educational program.

The responsiveness of modified revenues to changes in state personal income is illustrated in Table 20. Here it can be seen that the estimated income elasticity as it applies to the stricter definition of K-12 revenues is less than estimated when using the Legislative Analyst's total K-12 revenue figures. In particular, the latter value of .8088, which is computed for the years 1981-82 through 1984-85, reflects the recent trend toward increased K-12 funding; however, when compared to the .9194 elasticity computed using total funding figures, it again becomes apparent that basic K-12 funding is not as responsive to recent economic growth as originally projected.

Using the two revised estimates of elasticity, the projections of California personal income presented in Table 8, and the levels of modified revenues from Table 18, it is again possible to project likely levels of modified revenues through 1990. The predicted levels of modified revenues range between $18.9 billion and $20.4 billion. Unit elasticity would yield $22.2 billion (Table 21). Modified revenues per modified ADA in current dollars are projected to increase between 22.4 percent and 31.8 percent from 1984-85 to 1989-90 (Table 22). Unit elasticity would result in a 43.2 percent increase.

In terms of constant 1972 dollars, Table 22 demonstrates that modified revenues per modified ADA are projected to decrease by .7 percent (assuming .8088 elasticity) to 7.8 percent (assuming .6399 elasticity). Unit elasticity would effect a 7.8 percent increase in real funding, or a $110 increase in constant dollars per modified ADA. Again, it should be noted that there is no reason to believe that modified revenues will expand at a rate equal to growth in personal income; rather, a .6399 to .8088 elasticity is more likely. Consequently, modified per-pupil real funding at best will barely remain at present levels through the decade.

Following the procedure used in Table 13, it is possible to determine what expenditure levels would be necessary to maintain the status quo in terms of per-student real term spending. Table 23 demonstrates that, as with total funding as reported by the Legislative

TABLE 19
TRENDS IN TOTAL REVENUES FOR K-12 EDUCATION
1975-76 THROUGH 1984-85

Year	Adjusted Revenues ($Millions)	ADA (excluding adult ed.)	Total funding per ADA			
			Amount (current $)	% Change	Amount (1972-73 $)	% Change
1975-76	7,416.6	4,671,730	1,588	7.8%	1,239	0.1%
1976-77	8,035.8	4,510,100	1,782	12.2%	1,301	5.0%
1977-78	8,599.1	4,448,000	1,933	8.5%	1,314	1.0%
1978-79	8,446.7	4,107,815	2,056	6.4%	1,295	-1.4%
1979-80	9,969.0	4,054,720	2,459	19.6%	1,402	8.3%
1980-81	11,034.0	4,043,035	2,729	11.0%	1,419	1.2%
1981-82	11,177.7	4,044,831	2,763	1.3%	1,354	-4.6%
1982-83	11,332.3	4,072,169	2,783	0.7%	1,280	-5.5%
1983-84	12,607.6	4,103,563	3,072	10.4%	1,321	3.2%
1984-85*	14,151.6	4,175,072	3,390	10.3%	1,356	2.6%

* Estimated
Sources: [Same as Table 18]

TABLE 20
ESTIMATION OF INCOME ELASTICITY USING MODIFIED REVENUES FOR K-12 EDUCATION

Year	K-12 Revenues (Millions)*	State Personal Income (Billions)
1979-80	9,969.0	259.6
1983-84	12,607.6	375.6
Change	2,638.6	116.0
% change**	23.37%	36.52%

Income Elasticity = 23.37 / 36.52 = .6399

1981-82	11,177.7	311.0
1984-85	14,151.6	416.6
Change	2,973.9	105.6
% change**	23.48%	29.03%

Income Elasticity = 23.48 / 29.03 = .8088

* Excludes certain revenues not directly related to K-12 education.

** % change based on average of beginning and terminal year revenue and income. Source of data, see Table 18.

TABLE 21
REVENUES FOR K-12 EDUCATION WITH PROJECTIONS THROUGH 1990 BASED ON THREE ALTERNATIVE INCOME ELASTICITIES AND ON MODIFIED REVENUE AND ADA FIGURES

Year	Total Funding (Millions)
1975-76	7,416.6
1976-77	8,035.8
1977-78	8,599.1
1978-79	8,446.7
1979-80	9,969.0
1980-81	11,034.0
1981-82	11,177.7
1982-83	11,332.3
1983-84	12,607.6
1984-85*	14,151.6

PROJECTIONS WITH INCOME ELASTICITY EQUAL TO:

	.6399	.8088	1.000
1985-86	14,927.4	15,132.2	15,364.0
1986-87	15,813.4	16,267.3	16,789.0
1987-88	16,779.1	17,523.0	18,391.0
1988-89	17,818.0	18,894.4	20,170.5
1989-90	18,946.2	20,406.5	22,166.4
Change from 1983-84	50.3%	61.9%	75.8%

*Estimated

Source: 1975-76 through 1984-85, see Table 1. See text for discussion of income elasticity of revenue.

Determination of elasticities from Table 20.

TABLE 22
TOTAL MODIFIED REVENUES FOR K-12 EDUCATION PER MODIFIED ADA THROUGH 1990: IN CURRENT AND 1972 DOLLARS

Year	Current Dollars	Constant (1972) Dollars
1975-76	1,588	1,172
1976-77	1,782	1,243
1977-78	1,933	1,260
1978-79	2,056	1,229
1979-80	2,459	1,335
1980-81	2,729	1,366
1981-82	2,763	1,308
1982-83	2,783	1,274
1983-84	3,072	1,343
1984-85*	3,390	1,407

PROJECTIONS WITH INCOME ELASTICITIES EQUAL TO:

	.6399		.8088		1.000	
	Current $	1972 $	Current $	1972 $	Current $	1972 $
1985-86	3,589	1,410	3,638	1,429	3,694	1,451
1986-87	3,726	1,384	3,833	1,424	3,956	1,470
1987-88	3,875	1,361	4,047	1,421	4,247	1,491
1988-89	4,016	1,332	4,258	1,412	4,546	1,508
1989-90	4,148	1,297	4,467	1,397	4,853	1,517
Change from 1983-84		22.4%		31.8%		43.2%

*Estimated

Source: 1975-76 through 1984-85, see Table 1. See text for discussion of income elasticity of revenue.

Determination of elasticities from Table 20.

TABLE 23
EXPENDITURES REQUIRED TO KEEP REAL EXPENDITURES PER ADA AT THE 1983-84 LEVEL*

Year	Modified expenditures per modified ADA (1972 $'s)	Modified ADA (1,000's)	K-12 modified expenditures (1972 $'s) (millions)	K-12 modified expenditures (current $'s) (millions)
1983-84	1,343	4,009	5,384.1	12,313.4
1984-85	1,343	4,077	5,475.4	13,190.2
1985-86	1,343	4,159	5,585.6	14,220.9
1986-87	1,343	4,244	5,699.7	15,343.6
1987-88	1,343	4,330	5,815.2	16,561.7
1988-89	1,343	4,437	5,958.9	17,966.1
1989-90	1,343	4,568	6,134.8	19,619.1

*Excludes adult ADA and funding as well as selected other expenditures (see text).

Analyst, modified K-12 expenditures must also increase by 59.3 percent between 1983-84 and the end of the decade to maintain the status quo. The data in Table 21 indicate that modified revenues are expected to grow by 50.3 percent to $18.9 billion (assuming .6399 elasticity) and by 61.9 percent to $20.4 billion (assuming .8088 elasticity). It becomes clear that under the first assumption, modified revenues will fall $670 million short of the $19.62 billion needed to maintain the status quo, while the more optimistic assumption projects that modified revenues will grow $790 million above the amount needed to maintain the status quo. Again, we must conclude that under the foregoing scenario, there will be little room for accomplishing significant improvements in teacher salaries or in student-teacher ratios.

In short, when the Legislative Analyst's revenue and ADA figures are purged of selected revenues and ADA, it becomes apparent that the funding outlook is no more encouraging than originally projected. Indeed, it appears that growth in "strict" K-12 revenues is increasing at a lower rate and is less responsive to growth in the economy than is the growth of the selected "non-K-12" revenues.

NOTES

1. See, for example, Albert C. Hyde and William L. Jarocki, "Revenue and Expenditure Forecasting: Some Comparative Trends" in Public Budgeting and Finance, eds. Robert T. Golembiewski and Jack Rabin (New York: Marcel Dekker, Inc., 1983).

2. Ibid., p. 269.

3. See, for example, John C. Chambers, Satinder K. Mullick, and Donald D. Smith, "How to Choose the Right Forecasting Technique," Harvard Business Review: On Management (New York: Harper and Row, 1975), pp. 502-506.

4. See, for example, Marsha Wallace, "Focus on Immigration," in The UCLA Business Forcast for California, September 1984.

5. Jack W. Osman and John M. Gemello, "California School Finance: Policy Perspectives," in California Policy Choices, 1984, eds. John J. Kirlin and Donald R. Winkler (Sacramento, CA: Sacramento Public Affairs Center, University of Southern California, 1984).

6. It should be emphasized that these series were provided through the courtesy of Pacific Gas and Electric for the author's use in forecasting long-term school revenues. While they are current forecasts, they are not necessarily those used in Pacific Gas and Electric's official planning on rate analysis.

7. Using ADA, see National Education Association, Rankings of the States, 1984 (West Haven, Conn.: National Education Association, 1984).

8. Osman and Gemello, "California School Finance," p. 139.

TABLE A1
TOTAL REVENUES FOR K-12 EDUCATION: 1983-84 AND 1984-85
($Millions)

	Estimated 1983-84	1984-85 Budget as Enacted	Change From 1983-84	
			Amount	% Change
State:				
Gen'l Fund	$8,676.3	$9,933.3	$1,257.0	14.5%
Special Funds	77.5	79.6	2.1	2.7%
SUBTOTAL	$8,753.8	$10,012.9	$1,259.1	14.4%
Local:				
Prop.Tax Levy	$2,549.1	$3,006.4	$457.3	17.9%
State and Local				
SUBTOTAL	$11,302.9	$13,019.3	$1,716.4	15.2%
Other:				
Federal	$1,002.2	$1,082.6	$80.4	8.0%
State Capital Outlay	195.0	280.0	85.0	43.6%
Local Debt Serv.	439.9	429.8	-10.1	-2.3%
Local Misc. Rev.	792.1	792.1	0.0	0.0%
SUBTOTAL: OTHER	$2,429.2	$2,584.5	-155.3	-6.4%
TOTALS	$13,732.1	$15,603.8	$1,871.7	13.6%

Source: Legislative Analyst, Summary of Legislative Action on on the Budget Bill 1984-85 Fiscal Year , Table 6, p.15.

TABLE A2
PERCENT OF TOTAL REVENUES FOR K-12 EDUCATION DERIVED FROM DIFFERENT SOURCES 1983-84 AND 1984-85

Source	Estimated 1983-84	1984-85 Budget as Enacted
STATE		
General Funds	63.2%	63.6%
Special Funds	.6	.5
SUBTOTAL	63.7%	64.2%
LOCAL		
Property Tax Levies	18.6%	19.3%
STATE/LOCAL SUBTOTAL	82.3%	83.4%
OTHER		
Federal	7.3%	6.9%
State Capital Outlay	1.4	1.8
Local Debt Service	3.2	2.8
Local Misc. Revenue	5.8	5.1
OTHER SUBTOTAL	17.7%	16.6%
TOTALS	100.0%	100.0%

Source: Computed from data in Table A1.

TABLE A3
CALIFORNIA STATE GOVERNMENT GENERAL FUND EXPENDITURES
1982-83 THROUGH 1984-85
(Millions of Dollars)

	1982-83 Estimated	1983-84 Estimated	1984-85 Enacted	Change from 1983-84 Amount	Change from 1983-84 Percent
Education					
K-12	$7,578.1	$8,614.8	$9,348.3	$733.5	8.5%
State Teach. Retirement	235.5	61.5	585.0	523.5	851.2
U.C.	1,125.4	1,110.0	1,373.7	263.7	23.8
C.S.U.	907.3	948.0	1,152.4	204.4	21.6
Comm. Coll.	1,058.7	1,067.3	1,100.0	32.7	3.1
Other Post Sec.	92.2	94.2	107.3	13.1	13.9
SUBTOTAL	$10,997.2	$11,895.8	$13,666.7	$1,770.9	14.9%
Health and Welfare					
SUBTOTAL	$7,286.8	$7,259.2	$ 7,898.7	$639.6	8.8%
Other Programs					
SUBTOTAL	$3,471.1	$3,450.0	$3,758.6	$308.6	8.9%
TOTALS:	$21,755.1	$22,605.0	$25,324.0	$2,719.0	12.0%

Source: Legislative Analyst, Summary of Legislative Action on the Budget Bill 1984-85 Fiscal Year , Table 5, p. 14.

TABLE A4
DIRECT GENERAL EXPENDITURE, 1981-82
PERCENTAGE DISTRIBUTION BY FUNCTION
CALIFORNIA AND U.S. STATE AND LOCAL

	Local Educ.	Other Educ.	High-ways	Public Welfare	Health Hosp.	Police Fire	Sewer. Sanit.	All Other
U.S.	24.5%	11.2%	8.0%	13.0%	9.3%	5.4%	3.4%	25.3%
Calif.	21.6%	12.1%	4.4%	16.9%	8.9%	6.4%	3.0%	26.6%

Source: Advisory Commission on Intergovernmental Relations, Significant Features of Fiscal Federalism 1982-83 Edition , January 1984, p.144.

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